

WHAT IS CLAIMED IS:

1 1. A spacerless or geocomposite double bottom apparatus for a storage tank having a
2 metal bottom and upwardly extending metal sidewalls, which apparatus comprises:
3 a first lining layer of flexible plastic on top of said metal bottom;
4 a plastic grid having a plurality of openings therethrough on top of said first lining
5 layer;
6 at least one layer of fiber insulation on top of said grid; and
7 an upper metal bottom on top of said fiber material welded to said sidewalls.

1 2. A double bottom apparatus as set forth in Claim 1 wherein said first lining layer is
2 a high density polyethylene sheet.

1 3. A double bottom apparatus as set forth in Claim 1 wherein said plastic grid is
2 composed of high density polyethylene.

1 4. A double bottom apparatus as set forth in Claim 1 wherein said fiber insulation is
2 mechanically bonded mineral or glass wool.

1 5. A double bottom apparatus as set forth in Claim 4 including two layers of said
2 mechanically bonded mineral or glass wool.

1 6. A double bottom apparatus as set forth in Claim 1 wherein said upper bottom extends
2 through slots in said sidewalls and is welded thereto by welding to a flat bar extending from said
3 sidewalls.

1 7. A double bottom apparatus as set forth in Claim 6 wherein all welds are made from
2 above said upper bottom.

1 8. A double bottom apparatus as set forth in Claim 1 including a leak detection port
2 through said sidewalls between said original bottom and said upper bottom.

1 9. A double bottom apparatus as set forth in Claim 7 wherein said leak detection port
2 includes a clear cylindrical tube so that fluid therein is visible.

1 10. A double bottom apparatus as set forth in Claim 1 wherein a fluid tight containment
2 space is created between said upper bottom, said sidewalls, and said first lining layer.

1 11. A double bottom apparatus as set forth in Claim 10 wherein said fluid tight
2 containment space is purged of oxygen.

1 12. A double bottom apparatus as set forth in Claim 11 wherein said lining layer is
2 fastened to said metal bottom by a plurality of fasteners.

1 13. A double bottom apparatus for a storage tank as set forth in Claim 1 including a
2 sealant between said first lining and said sidewalls.

1 14. A method of installing a spacerless double bottom for a storage tank having a metal
2 bottom and upwardly extending sidewalls, which method comprises the steps of:

3 installing a first lining layer of flexible plastic on top of said metal bottom;
4 installing a plastic grid having a plurality of openings therethrough on top of said
5 lining layer;
6 installing at least one layer of fiber insulation on top of said grid; and
7 installing a new upper metal bottom above said natural fiber material.

1 15. A method of installing a spacerless double bottom apparatus as set forth in Claim 14
2 including the additional step of affixing said lining layer to said metal bottom.

1 16. A method of installing a spacerless double bottom apparatus as set forth in Claim 14
2 wherein said step of installing at least one layer of fiber insulation includes installing two layers of
3 said fiber insulation.

1 17. A method of installing a spacerless double bottom apparatus as set forth in Claim 14
2 wherein said step of installing a new upper metal bottom includes the steps of cutting a plurality of
3 openings through said sidewalls, inserting a plurality of flat plates in said tank and through said
4 sidewalls, and welding said flat plates to said sidewalls.

1 18. A method of installing a spacerless double bottom apparatus as set forth in Claim 17
2 wherein all welding is performed from above said flat plates.

1 19. A method of installing a spacerless double bottom apparatus as set forth in Claim 14
2 wherein said flat plates are welded to flat bars previously welded and extending from said sidewalls.

1 20. A method of installing a spacerless double bottom apparatus as set forth in Claim 14
2 wherein said lining layer, said sidewalls and said upper bottom form a fluid-tight secondary container
3 and including the additional step of purging said container of oxygen.

1 21. A method of installing a spacerless double bottom apparatus as set forth in Claim 14
2 including the additional step of installing a leak detection port through said sidewalls.